

**Claims**

Claims 1-6, 8-13 and 15-20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Ozawa et al. (6,386,466).

**Analysis**

Of the rejected claims, only claims 1, 8 and 15 are in independent form; therefore, the following discussion is initially directed to these independent claims.

Ozawa fails to disclose several of the features recited in claim 1. In particular, this reference fails to disclose, teach or suggest (1) the specific structure of the inclined portions, (2) the relative speeds of the injection, or (3) the structure of the cleaning liquid ejection portion formed inside a gas ejection port.

First, Ozawa does not disclose a trumpet shaped portion formed by multiple inclined portions located upstream of the minimum diameter portion and another inclined portion interposed between the gas injection port and the minimum diameter portion. Rather, Ozawa merely discloses an inclined portion upstream of the minimum diameter portion 60 and an inclined portion disposed downstream of the minimum diameter portion 60. Moreover, there is no additional inclined portion interposed between the gas injection port and the minimum diameter portion. Still further, there is no teaching or suggestion for providing this structure in Ozawa.

Second, Ozawa does not teach or suggest that a gas should be injected at a speed higher than that of the cleaning liquid. While the Examiner asserts that it would have been obvious because it has been held that discovering the optimum value of a result effective variable only

involves routine skill in the art, this is not the case with the instant rejection. Ozawa discloses preferred pressures for feeding the gas and liquid, but does not discuss the speeds. Thus, there is no indication that the relative speed of the injections would achieve a particular result.

According to MPEP § 2144.05, a particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. See also, *In re Antonie*.<sup>1</sup>

Finally, Ozawa does not disclose the specific structure of the cleaning liquid ejection portion formed inside a gas ejection portion, as provided in the claimed invention.

In view of the foregoing, Ozawa does not render claim 1 obvious.

Turning to independent claim 8, Ozawa fails to disclose several of these features also. For instance, Ozawa fails to disclose (1) the curved surface upstream of the minimum diameter portion; (2) a gas injection port formed along the curved surface; (3) a gas being ejected at a speed higher than that of the cleaning liquid, or (4) a cleaning liquid ejection portion formed inside a gas ejection port.

None of these features is taught or suggested by Ozawa. There is no reason one of ordinary skill in the art would have thought to modify Ozawa to have such features. Thus, Ozawa fails to render claim 8 obvious.

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<sup>1</sup> 559 F.2d 618, 195 USPQ 6 (CCPA 1977).

Turning to independent claim 15, Ozawa does not render this claim obvious either for similar reasons to those discussed above. Namely, Ozawa does not teach or suggest that the relative speeds of the injection of the gas and liquid are result effective variables; rather Ozawa focuses only on the relative pressures of the gas and liquid. Moreover, Ozawa does not teach or suggest that a cleaning liquid ejection portion should be formed inside gas ejection port. Thus, claim 15 is patentable.

The remaining rejections are directed to the dependent claims. These claims are patentable for at least the same reasons as claims 1, 8 and 15, by virtue of their dependency therefrom.

In addition, the ratios of the cross-sectional areas of the various portions of the cleaning nozzle is not a matter of discovering an optimum value. First, Ozawa does not teach or suggest any correlation between the cross-sectional areas or that they achieve a particular result. Thus, there is no indication that such a ratio is a result-effective variable based on the teachings of Ozawa. Second, the overall physical structure of the nozzle in the present invention is completely different than that of Ozawa, and thus, there is no reason why one would have thought to have modified Ozawa to arrive at the particular ratios recited in dependent claims 4-6, 11-13, and 18-20. In other words, there is no support that the recited ratios would receive a particular desired result considering the fact that the structure in Ozawa is completely different than the nozzle of the present invention.

Request for Reconsideration Under 37 C.F.R. §1.111  
U.S. Appln. No. 09/894,008

### Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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